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EXTRA-SENSORY PERCEPTION AMONG THE BLIND

MARGARET M. PRICE and MARGARET H. PEGRAM

ABSTRACT: In a study of extra-sensory perception in the blind, 66 subjects ranging in age from 8 to 35 years were given various card-calling tests. The total average above chance for all subjects significantly indicated that extra-sensory perception occurred among the subjects. Forty-four per cent of the subjects gave individually significant scores. No reliable correlation was noted between ESP scoring ability and age, extent of blindness, nor with the time in which the subject became blind. Some of the significant subjects were totally blind. When the subjects matched sealed cards their scores were higher than in similar matching of open cards.

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Introduction

The wide-spread popular belief that blind people are peculiarly endowed with a high degree of "intuition," or that they possess a compensatory "sixth sense" suggests a scientific study of extra-sensory perception in the blind.

Various questions arise in this connection: (1) Are blind subjects capable of extra-sensory perception? (2) If they do have such a capacity, how does it compare with the abilities of seeing subjects? (3) Is there any correlation between the extent of visual impairment and the capacity for extra-sensory perception? (4) Is there any relationship between ESP ability and the length of time which the subject has been blind?

It is of particular interest to see whether subjects who have been totally blind from birth, i.e., who have never had visual experience, are able to respond to stimuli which are commonly experienced only through the visual sense in sensory perception.

The general problems considered in this paper are: (1) Whether extra-sensory perception can be demonstrated by blind subjects; (2) whether the occurrence of this capacity correlates with the degree of

blindness; (3) whether there is any difference in ESP scoring ability between subjects who have been blind since birth and those who have lost their sight later in life.

In addition, the following studies were made: (1) A comparison of scores obtained by methods which involved verbal indication of guesses with those which involved non-verbal responses; (2) a comparison of results obtained when the cards to be guessed were sealed in envelopes (sealed card packs) with results obtained when the cards were not enclosed in envelopes; and (3) a comparison of the average scores for each experimental period.

Further analyses of the data will appear in a later report, and a comparative study of seeing and blind subjects made under closely comparable circumstances is contemplated.

Survey of Subjects, Methods, and Conditions

Subjects: Two groups of subjects were used in this investigation. One group was composed of 61 boys who were enrolled in the State School for the Blind, in Raleigh, North Carolina (the criterion for entrance to which is inability to read pica type at a distance of one foot from the eyes). The age range for this group was from 8 to 23 years. Approximately sixty per cent of the boys enrolled were included in this group. They were selected as a representative group by the superintendent of the school. The second group was made up of five employees of the Durham Workshop for the Blind who volunteered to act as subjects. Ages of this group ranged from 19 to 35 years.

Altogether, there were 66 subjects ranging in age from 8 to 35 years and varying educationally from first grade pupils to high school graduates.

There was, therefore, a large number of partially blind subjects with a wide difference in the amount of sight. Nine of the total number of subjects have been totally blind from birth, and five more became totally blind at a later date. For purposes of this experiment, the group listed as partially blind has been subdivided into two groups: (1) Those who were able under some conditions to see and recognize printed figures; and (2) those who were not able under any conditions to read printed matter. In the former group there were 43 subjects; in the latter, 9 subjects, 6 of whom have been too blind to see printed matter since birth. These facts are tabulated in Table I.

Materials: Two types of card packs were used in these experiments. (1) One consisted of the regular ESP cards[1] (2) the second set of cards was similar to the first in that the same kind of cards and the same symbols were used; they differed in that each card had a blank card glued to the face of it, so that the symbol was inside, and this was sealed in an opaque brown envelope. Each envelope was taped around the outside with gummed paper to make the sealing secure. These cards were identified by a numeral printed on the back of the envelope in a code unknown to the subjects.

In order to acquaint the subjects with the symbols, five sample cards with raised symbols, made by pasting figures cut from cardboard on the cards, were presented to each subject.

Methods: For GESP (General Extra-Sensory Perception), the cards are shuffled and the pack placed face down screened from the subject. The experimenter removes the top card and looks at it while the subject attempts to call it. The card is then placed aside and the next card is treated the same way. This is continued for the 25 calls. This was found to be the most satisfactory method for introducing subjects to the experimental procedures because these subjects seemed to think it more "reasonable" to try to name the cards when the experimenter was looking at them. For GESP, as well as for all the methods used, the subject is not allowed to know his score or what cards he has called correctly until the end of a run of 25 calls.

A shift to BT ("Before Touching") was usually made near the end of the first experimental period with each subject. BT is similar to GESP except that the experimenter does not look at the cards until after the 25 calls have been made. That is, in GESP both clairvoyance and telepathy are possible; in BT telepathy is presumably ruled out.

Three matching techniques were used: (1) OM (Open Matching), (2) BM (Blind Matching), and (3) MP (Match Piling). All the matching techniques have one feature in common: The subject makes his guesses by distributing the twenty-five cards in five different packs. For OM and BM there are five key cards consisting of one each of the five symbols. These cards are arranged in a row, and the subject indicates the guess he makes for each card by placing it in a pile opposite one of the five key cards.

In OM the key cards are placed face up and the subject is told the order of the cards. The cards with raised symbols were used as key cards for some of the subjects, particularly the younger subjects who

[1] Illustrated in plate opposite page 1, *Journal of Parapsychology,* Vol. I, No. 1.

TABLE I

DATA OF INDIVIDUAL SUBJECTS.

Subject	Age	Degree of Blindness*	With Experimenter M. M. P.				With Experimenter M. H. P.			
			Runs	Dev.	Av.	C. R.	Runs	Dev.	Av.	C. R.
E. G.....	10	p. b.	42	81	6.81	6.42	35	20	5.57	1.69
Ri. M.....	13	p. b.	40	61	6.53	4.82	15	10	5.67	1.29
J. Ma.....	15	p. b.	40	56	6.40	4.43	11	— 7	4.36	.60
E. R.....	19	p. b.	58	66	6.13	4.33	22	10	5.45	1.07
B. J. M. ..	8	t. b.	13	29	7.23	4.02	15	20	6.33	2.24
A. H.....	16	p. 3	41	51	6.24	3.98	.....	.....	.....	.....
P. M.....	13	p. b.	33	43	6.30	3.75	24	20	5.83	2.04
B. R.....	15	p.	26	36	6.42	3.63	.....	.....	.....	.....
C. C.....	13	p.	15	28	6.86	3.61	.....	.....	.....	.....
M. H.....	21	p. t.	26	36	6.38	3.53	.....	.....	.....	.....
G. C.....	13	p.	14	26	6.86	3.47	12	18	6.50	2.60
D. Cr.....	16	p. t. b.	25	35	6.04	2.85	.....	.....	.....	.....
E. Goo....	11	t. b.	24	32	6.33	3.26	12	2	5.16	.29
Ray Mo...	25	p.	22	30	6.36	3.20	.....	.....	.....	.....
Pat. N....	12	p. b.	48	44	5.91	3.18	21	4	5.19	.44
W. S.....	15	p.	21	29	6.38	3.17	.....	.....	.....	.....
B. R. M...	13	p. b.	21	29	6.38	3.17	.....	.....	.....	.....
T. A.....	15	p. b.	57	47	5.82	3.11	27	4	5.14	.38
J. H.....	13	p.	47	38	5.81	3.04	.....	.....	.....	.....
H. C. M...	11	p. t. b.	29	33	6.13	3.06	6	— 3	4.50	.61
J. K.....	13	p. b.	22	28	6.27	2.99	23	7	5.30	.73
Da. Ne....	35	t. b.	35	34	5.97	2.87	.....	.....	.....	.....
J. T. Mi. .	18	p.	70	46	5.66	2.81	6	3	5.50	.61
H. R.....	17	t.	40	35	5.88	2.77	.....	.....	.....	.....
D. F.....	15	t. 10	48	37	5.77	2.67	.....	.....	.....	.....
I. H.....	19	t. b.	22	25	6.14	2.67	.....	.....	.....	.....
P. O.....	19	p. b.	38	35	5.92	3.11	.....	.....	.....	.....
J. V. H....	18	p. t. 8	27	26	5.96	2.50	.....	.....	.....	.....
H. E.....	10	p. b.	22	21	5.95	2.23	.....	.....	.....	.....
Jo. H.....	13	p.	11	14	6.27	2.11	.....	.....	.....	.....
D. Con....	12	p. b.	60	27	5.45	1.74	26	0	5.	.00
A. Hod....	16	p. 3	3	5	6.67	1.45	.....	.....	.....	.....
Cl. C.....	14	p. b.	18	12	5.66	1.43	.....	.....	.....	.....
D. Cobb ..	11	p. b.	6	7	6.16	1.42	.....	.....	.....	.....
N. C.....	15	p.	15	11	5.73	1.42	18	— 3	4.83	.35
J. D. H....	13	p.	15	11	5.73	1.42	12	— 3	4.75	.43
S. E.....	15	p. b.	16	10	5.62	1.25	.....	.....	.....	.....
H. Mi.....	17	p.	32	14	5.43	1.24	.....	.....	.....	.....
J. B. H....	10	p. t. b.	24	9	5.37	.92	6	3	5.50	.61
V. E.....	15	p. b.	19	8	5.42	.92	.....	.....	.....	.....
L. G. T....	13	p. b.	10	5	5.50	.79	.....	.....	.....	.....
J. D.....	13	p. b.	11	5	5.55	.75	.....	.....	.....	.....
G. P.....	23	p. t. 15	18	6	5.33	.71	.....	.....	.....	.....
F. R.....	12	t.	10	4	5.40	.63	.....	.....	.....	.....
Wo. St....	19	p. t. b.	32	7	5.21	.62	.....	.....	.....	.....
C. Y.....	15	p. b.	11	4	5.36	.60	.....	.....	.....	.....
W. S.....	15	p.	26	4	5.15	.39	.....	.....	.....	.....
R. C.....	24	p.	26	3	5.11	.29	.....	.....	.....	.....
W. L.....	12	p. b.	27	3	5.11	.29	.....	.....	.....	.....
D. P.....	9	p. 2	35	3	5.09	.25	.....	.....	.....	.....
R. B.....	.....	p. b.	15	2	5.13	.25	.....	.....	.....	.....
J. E.....	12	p. b.	8	1	5.12	.18	6	1	5.17	.20
G. B.....	8	t. b.	15	1	5.08	.12	.....	.....	.....	.....
E. P.....	16	p. 5	27	11	5.40	1.16	.....	.....	.....	.....

TABLE I—CONTINUED

Subject	Age	Degree of Blindness*	With Experimenter M. M. P.				With Experimenter M. H. P.			
			Runs	Dev.	Av.	C. R.	Runs	Dev.	Av.	C. R.
H. M.....	24	t. b.	8	0	5.00	.00	.....	.....	.....	.....
B. C.....	19	t.	29	— 4	4.86	.14	.....	.....	.....	.....
B. B.....	6	p. b.	8	— 1	4.87	.18	.....	.....	.....	.....
D. Ca.....	21	p. b.	51	— 7	4.86	.48	3	4	6.33	1.15
P. T.....	17	p. b.	9	— 3	4.67	.50	.....	.....	.....	.....
B. Geo....	16	p. 11	21	— 5	4.76	.54	.....	.....	.....	.....
C. B.....	25	t. b.	20	— 5	4.75	.56	12	— 3	4.75	.43
B. M.....	18	p. l.	17	— 5	4.70	.61	.....	.....	.....	.....
R. B.....	18	p. t. b.	8	— 4	4.50	.70	.....	.....	.....	.....
J. Hall....	18	p. t. b.	11	— 6	4.45	.90	.....	.....	.....	.....
T. E.....	19	p. b.	12	— 7	4.41	1.01	.....	.....	.....	.....
L. E. Hall.	20	t. b.	39	—15	4.62	1.20	.....	.....	.....	.....

* t = totally blind, pt = practically totally blind (i. e., too blind to see the symbols), b = this condition of blindness existed at birth, numerals = age at which blindness developed. (When no second designation appears data is absent from the records.)

were totally blind, so that they might touch the raised figures while the experimenter placed the cards opposite the key card indicated. This procedure was discontinued when the subject became thoroughly familiar with the order of the key cards.

BM differed from OM in that the key cards were placed face down, so that the subject attempted to match symbols whose order he had not been told and could not know himself through the senses, against key cards that were likewise unknown.

For MP no key cards were used. The subject distributed the pack of cards in five packs and then, after all the cards had been placed he "named" the piles; that is, he touched each pile and said "This is the circle pile, that is the star pile," etc.

Sealed card packs were used predominantly for all the methods except for GESP, which was done entirely with open card packs.

Procedures and Precautions: The atmosphere during the whole experiment was kept as informal as possible. The subjects viewed the experiment as a game in which each wished to do as well as he could. Candy rewards were occasionally given, but they were used infrequently so that they did not come to be goals in themselves. That is, the subjects did not as a rule expect or work for the reward. Competition was used when the subjects seemed to respond well to it. Boys were allowed to stand around while they were awaiting their turns and to talk among themselves as long as they did not interfere with the subject or seem to be having a disturbing effect on him.

With the conditions of freedom that prevailed, it was necessary to

have certain strictly enforced rules. (1) No person was allowed to stand beside or behind the experimenter. (2) For all GESP and BT work a stiff-backed notebook (9″ x 12″) was used as a screen behind and close to which the experimenter held the cards so that the cards were invisible to the subjects and spectators while the calls were being made. (3) The subject was kept at least four feet from the experimenter, usually seated at the opposite side of the table.

Additional precautions were taken. (1) New cards were frequently substituted for old decks for all work in which the subject handled open cards. The cards, which are stamped by hand with rubber stamps, do not have perceptible ridges caused by the ink or stamping. (2) For unscreened work (i.e., for conditions other than BT and GESP), sealed packs were used predominantly. This is particularly significant as a precaution because (a) the subjects were never told what symbol card was in any envelope; (b) the code was never revealed to any subject; (c) the code numbers were so small as to be indistinguishable by any subject; (d) three different packs of sealed cards with three different codes were used.

Two further checks on the results were attempted. (1) Two experimenters worked independently with some of the same selected subjects.[2] (2) A considerable part of the work was witnessed by teachers at the school or was observed and checked by a second experimenter. (See Table II.)

RESULTS

Occurrence of ESP Among Blind Subjects: The results of this experiment give considerable evidence that extra-sensory perception does occur among blind subjects. For a total of 2,024 runs there were 11,518 correct calls, or a positive deviation of 1,398. This gives an average of 5.69 hits per 25 calls from a mean expectation of 5. This deviation is 16.99 times the standard deviation. The odds against so large a deviation occurring by chance in this number of trials are 10^{54} to one. 28 of the entire 66 subjects had individually significant total scores; that is, had positive deviations which were at least 2.5 times the standard deviation. This significant scoring from 44 per cent of the subjects tried is a higher percentage than any previously reported.

Relation of History of Blindness to Success in ESP Scoring: Subjects were classified in three groups: (1) Those totally blind; (2) those

[2] It would be unwise to conclude that the failure of one experimenter to obtain successful results with a subject who had succeeded with another experimenter in any way invalidated the good results; but if two experimenters do succeed with the same subject, the case is strengthened.

too blind to see the symbols stamped on the ESP cards; and (3) those partially blind, but with sight enough to distinguish the symbols on the cards. These groups were further subdivided on the basis of the time of onset of blindness, i.e., whether the condition existed at birth or developed later.

Table II shows the number of independently significant subjects for each group, i.e., those whose results show a critical ratio of 2.5 or more.

TABLE II

DISTRIBUTION OF SIGNIFICANT SUBJECTS.

Degree of Blindness	Total number of subjects	Number of "significant" subjects	Per cent "significant"
(1) Totally blind	14	6	42%
(a) From birth	9	4	44%
(b) Later	5	2	40%
(2) Too blind to see cards	9	4	44%
(a) From birth	6	2	33%
(b) Later	3	2	66%
(3) Able to discriminate symbols	43	19	44%
Total	66	29	44%

The results show very little variation for the different extents of deficiency of sight or for the time of onset of blindness. The number of subjects in each group is too small, however, for final conclusions to be drawn.

Relation of ESP to age: In order to see if there were any optimum age level for extra-sensory perception, the subjects were tabulated according to age. The significant subjects were tabulated in the same manner (see Table III). The results show the distribution of significant subjects throughout the age group from 6 to 35. The small number of subjects used in the younger and older ranges makes the drop in percentage unreliable for any conclusion as to a real difference.

TABLE III

THE AGE RANGES OF INDIVIDUALLY SIGNIFICANT SUBJECTS.

Age	Number Subjects Tested	Number Individually "Significant Subjects"	Per Cent "Significant"
6 — 10	7	2	29%
11 — 15	28	15	54%
16 — 20	22	9	41%
21 — 35	9	3	33%

Sealed cards: Sealed card work was introduced as a further precaution against the possible effect of hyperacuity of touch which the blind

may develop. In order to prevent the subject's considering the precaution an indication of suspected dishonesty (which would have created an unfortunate experimental atmosphere), the sealed cards were presented in a particularly favorable light as their own special problem at which they should succeed exceptionally well. No suggestion of any difficulty of the method was made. Thereafter, the changes between open and sealed card packs were made without comment.

Compared to the average for methods using open cards, the averages for sealed cards were high. For runs with open cards there were 911 runs averaging 5.57 for sealed cards, 778 runs with an average of 5.96.

This superiority of sealed card scores *may be attributed* to three causes: (1) The favorable introduction given the procedure; (2) that the sealed cards were more easily manipulated by the blind subjects for matching techniques and hence produced less distraction than the open cards; and (3) that the envelope renders the cards psychologically less available; that is, psychologically more distant. It is speculative but interesting to point to the parallel between this and the effect of increased distance upon scoring reported by Rhine (1, p. 106).

Comparison of Results for Various Methods.

The comparison of methods which involved verbal response to the cards (BT and GESP) and those which involved non-verbal indications (the matching techniques) shows very little difference between the two. For the methods which required the verbal calling of the cards there were 1,093 runs with an average of 5.75. In the non-verbal group there were 596 runs with an average of 5.77.[3] Those subjects who had significant total scores, i.e., all those subjects whose deviations had an X-value of 2.5, showed a very slight difference favoring the matching techniques, with an average of 6.26 for matching techniques and 6.21 for calling techniques.

There were interesting individual differences in the relative success attained by subjects for the various matching techniques. These methods seemed to present different tasks psychologically to the various subjects. There seemed to be two fairly distinct groups: (1) Those whose scores were highest on MP and lowest on OM; and (2) those who had a reverse of this order with highest scores on OM, lower scores on BM and lowest scores on MP. Most subjects could be placed

[3] The discrepancy between the total average of 5.69 noted on page 148 and the average of 5.76 of these and following figures is due to the former being the average for all the work, and the later averages being based upon the totals for the comparison study only.

in one of these two groups. More subjects fell in group one than in group two as indicated by the totals: OM, 251 runs averaging 5.84; BM, 133 runs averaging 5.95; and MP, 65 runs averaging 6.21. In this data, all OM using open card packs have been excluded in order to make the conditions more strictly comparable. These averages are for methods using sealed card packs exclusively.

The significant subjects were evenly distributed in the two groups; i.e., about half were highest on OM and lowest on MP, and about half were lowest on OM and highest on MP. The fact of wide individual variations is, of course, obscured in the total score, so that OM and MP are both brought to approximately the same averages and BM, which for both groups had an intermediate average, is left with the highest total. The higher BM scores are particularly interesting in the light of the fact that exactly the opposite was noted by Woodruff and George (3, p. 24). Averages for this group of significant subjects were: OM, 149 runs averaging 6.10; MP, 43 runs averaging 6.23; BM, 85 runs averaging 6.45. A possible explanation for these differences is that the methods seemed to present psychologically to the subjects graduating steps of restraint—open matching being most restricted and match piling being the least restricted. Since open matching presents five cards face up which are to be matched by the sealed cards in the subject's hands the subjects often seemed to feel limited and distracted because they paid too much attention to the key cards. With BM, when the key cards are face down, this restriction seems partially to disappear. The cards are to be matched to cards which the subject cannot be sure he knows and he usually abandons the attempt to "figure them out." Matching piling is the least limiting method of all, since the subject himself piles them at will and designates later as he chooses.

In general these relations of the scores for the three methods were consistent for all of the subjects throughout the experiment.

Comparison of Results of the Subjects for Their Successive Experimental Periods. The subject decline curves noted by Rhine (1, p. 159), and the bearing any general rise or fall in scoring level would have upon method comparisons introduced at various times suggest a study of the trend of scoring for the successive experimental periods.

For this study, totals were obtained for each testing period; i.e., the scores made by each subject were totalled for each day that he was tested, and averages were obtained. The results show that the averages increase fairly steadily for the first five periods of work after which there was a sharp decline. A summary of this data is shown in Table IV.

It is possible that the rise may be due simply to increased experience with the task. The fact that, because of the number of subjects, less individual attention was given the experienced subjects toward the end of the experimental period might well account for a decline of interest and the resulting drop in scoring noted.

TABLE IV

COMPARISON OF AVERAGES FOR ALL SUBJECTS FOR THEIR SUCCESSIVE TESTING PERIODS.

Testing Period	Runs	Deviation	Average	X-Value
1st	402	+224	5.56	6.12
2d	373	+246	5.65	6.97
3d	305	+290	5.95	9.09
4th	242	+181	5.75	6.37
5th	154	+158	6.03	6.97
6th	86	+ 77	5.89	4.54
7th	70	+ 74	6.05	4.84
8th	40	+ 9	5.22	.78
9th	17	+ 25	6.47	3.32

When treated similarly, the results for the significant subjects show the same trend: Averages increase steadily, reaching a peak during the seventh period and then declining (See Table V.)

TABLE V

INDEPENDENTLY SIGNIFICANT SUBJECTS' AVERAGES BY EXPERIMENTAL PERIODS.

Period	Runs	Deviation	Average	Critical Ratio
1	176	+183	6.04	7.55
2	198	+242	6.22	9.42
3	166	+214	6.29	9.09
4	148	+151	6.02	6.79
5	104	+113	6.09	6.06
6	62	+ 83	6.34	4.39
7	54	+ 76	6.41	5.67
8	18	+ 1	5.06	....
9*	17	+ 25	6.47	3.32

*One subject.

DISCUSSION

Alternative Hypotheses:

(a) Sensory Cues: The fact that all these subjects had impaired vision, some to the extent of total blindness, in itself is a safeguard against visual cues. Additional precautions against any possible visual cues were taken, however. All the work done with the calling methods was done with the subject at a distance of four or more feet and with the cards screened from the subject and from any other person (with

the exception of another experimenter observing the testing) who might be present.

Auditory cues were made improbable both by the distance of the subject from the experimenter and by the presence of numerous other noises. For all the methods except GESP, which was used only during the first working period with each subject, the experimenter did not look at the card until after the subject had made his call.

The use of the sealed card packs served as a further guard against the subject's learning to identify the cards by cues obtained from the cards, because the subject had no opportunity to learn when a card was called correctly, since he was not allowed to observe the checking and since he could not discover through the senses the identity of the cards. The use of this pack was a precaution also against visual and tactual cues.

(b) Error, Deliberate or Unconscious: The precautions discussed were taken to guard against the possibility of the subject's being able to obtain knowledge of the cards through the senses, either by means of unconscious utilization of sensory cues or by deliberate attempt at deception.

The possibility of explaining the results obtained by unintentional inaccuracies or by deliberate falsification of the scores on the part of the experimenters was rendered unlikely by further methods of validation: (1) Significant results were obtained when both the experimenters were observing the subject's work; (2) significant results were obtained by the two experimenters working independently with the same subjects; and, (3) significant results were obtained when various teachers at the school observed the experiments. Table VI gives a summary of the results obtained under these conditions.

Blindness: Although the observation of 44 per cent of successful subjects among the population tested is markedly higher than any previously reported it is not possible yet, because of the absence of strictly comparable data, to draw conclusions as to the relative frequency of occurrence of ESP subjects among the blind and the normal population. The high proportion noted cannot be considered significantly unusual until further research has been done with non-blind groups of comparable age and grade and under similar social conditions. The great interest shown in the tests by the institutionalized children who found it a break in routine would be a factor towards higher scoring. The specific effect of the experimenter in the test situation, such as was noted by Sharp and Clark (2. p. 135), seems a matter worthy of further study.

TABLE VI

RESULTS OF TESTS WITH ONE AND WITH TWO OBSERVERS.

DOUBLY OBSERVED				
Second Observer	Runs	Deviation	Average	Critical Ratio
Miss P	24	+ 6	5.25	0.61
Miss K	43	+39	5.79	2.96
Miss S	21	+50	7.38	5.44
Miss J	12	+15	6.25	2.17
MHP*	23	+30	6.30	3.13
SINGLY OBSERVED				
Observer				
MMP	1,676	+1,414	5.84	17.27
MHP	335	+ 114	5.34	3.14

*The senior author.

Another suggestion toward the unreliability of the conclusion of exceptional ability among the blind is the fact that no relation was shown to degree of blindness. Partially blind subjects performed as well as those totally blind.

SUMMARY

This study is a preliminary survey of experiments in extra-sensory perception with blind subjects. The following general problems were considered: (1) Whether blind subjects were capable of extra-sensory perception; (2) whether this ability correlates with the degree of blindness; (3) whether there is any difference in ESP ability between subjects who have been blind from birth and those who have lost their sight later in life.

Twenty-eight of the sixty-six subjects tested had deviations with critical ratios of 2.5 or more. There seemed to be no correlation between ESP scoring ability and age, extent of blindness, nor with the time in which the subject became blind. Subjects who were able to score significantly were found at all ages from 8 to 35 years; some of the significant subjects were totally blind, some were only partially blind.

Averages for sealed card work were considerably higher than those for open card work; this difference may have been partly due to a more favorable manner of presentation for the sealed card work and to the greater ease with which the cards may be manipulated. Other possible explanations may arise after further investigation.

The scores show that the average scoring rate improved for the first five periods of testing (six periods for the group of significant subjects); during the fifth period the highest averages for the entire

experimental period was obtained after this. The averages for the following testing periods declined.

A later report will present further analysis of this data, together with the results of the continuation of this investigation along related lines. Some of the questions raised in this report will receive consideration at that time.

REFERENCES

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GLOSSARY

In order to avoid constant redefining of commonly recurring terms in papers appearing in this journal, the following definitions are submitted for convenient reference. In case of any discrepancy between Glossary and usage in the text of an article the latter should be followed. Words defined elsewhere in the Glossary are italicized in the text of the definitions.

AGENT: In tests for *telepathy,* the person whose mental states are to be apprehended by the *percipient.*

AVERAGE SCORE = AVERAGE: Average number of *hits* per *run.*

BT (BEFORE TOUCHING): The technique in which the top card of the face-down *deck* is *called* and, after being *called,* is laid aside for *checking* at the end of the *run.* Each card in the *deck* is treated in the same way.

BM (BLIND MATCHING): The technique in which the *subject matches* a *deck* of *ESP cards* to five *key cards* which are laid out face down before him in an unknown order. Unless otherwise stated, the order is also unknown to the experimenter.

CALL V.: To designate a card by naming one suit either orally or by indicating it manually (as pointing or writing).

CALL N.: The response described above; also, the resulting selection.

CHANCE: The complex of undefined causal factors irrelevant to the purpose at hand.

CHANCE EXPECTATION = MEAN CHANCE EXPECTATION: The most likely *score* if only *chance* obtains.

CHANCE AVERAGE: *Mean chance expectation* in terms of *average* per *run.*

CHECK: To determine a *score* after the completion of a *run* by comparing the order of the *subject's calls* with the order of cards in the *deck.*

CLAIRVOYANCE: *Extra-sensory perception* of objective events as distinguished from *telepathic* perception (of the mental or subjective events of another person).

CRITICAL RATIO = X VALUE: The observed *deviation* divided by the *standard deviation.*

DECK: Twenty-five *ESP cards,* five of each suit.

DEVIATION: The amount an observed number of *hits* or an *average score* varies from the *mean chance expectation* or *chance average.* A *deviation* may be total (for a series of *runs*) or average (per *run*).

DT (DOWN THROUGH): The technique in which the cards are *called* down through the *deck* before any are removed or *checked.*

EMPIRICAL CONTROL: An experiment which wholly or partially follows the main experiment with the exception that the conditions are designed to exclude the possibility of *ESP.*

ESP (EXTRA-SENSORY PERCEPTION): Response to an external event (perception) not presented to any known sense.

ESP CARDS: *Cards,* each bearing one of the following five symbols: Star, circle, three parallel wavy lines (called "waves"), rectangle, plus.

ESP SYMBOLS: See plate opposite page 1, this journal Vol. I, No. 1, March 1937.

ESP TESTS: A considerable number of techniques come under this heading, conveniently represented by initials, the principal ones being: *BT, DT, PT, GESP, BM, OM, STM.*

EXTRA-CHANCE: *Significantly* different from *chance expectation.*

GESP = GENERAL (OR UNDIFFERENTIATED) EXTRA-SENSORY PERCEPTION: A technique designed to test the occurrence of *extra-sensory perception,* permitting either *telepathy* or *clairvoyance* or both to operate.

KEY CARD: One of the five cards (where there are five suits) against which the cards of the test *deck* (i.e. *target cards*) in the *matching* tests (*OM, BM, TM,* etc.) are *matched.*

MATCHING: A form of *calling* in which a *target card* is placed opposite the *key card* which the *subject* selects to identify it.

OM (OPEN MATCHING): The technique in which the *subject matches* a *deck* of *ESP cards* to five *key cards* which are face up before him.

PERCIPIENT: The person who perceives. In this journal the common use will pertain to *ESP* rather than to sensory perception.

PT (PURE TELEPATHY) = TELEPATHY: The word "pure" emphasizes the exclusion of *clairvoyance.*

RELIABILITY: *Significance.*

RUN: The presentation and *calling* of 25 *ESP cards* or *symbols* in succession.

SCORE: The number of *hits* made in one *run.*
TOTAL SCORE: *Score* of any number of *runs.*
AVERAGE SCORE: *Total score* divided by number of *runs.*

SCREEN: An opaque barrier used between the subject and the card or agent. The main types of screens will be illustrated in this journal on their first introduction in print.

STM (SCREENED TOUCH MATCHING): The *touch matching* technique with an upright *screen* preventing vision by the *subject* of the handling of the cards by the experimenter.

SERIES: Several *runs* that are grouped consecutively or according to some other principle.

SIGNIFICANCE: The unlikelihood that a given event (or series) will not on the average occur by chance more often than once in 150 such events (or series). [Arbitrarily taken to mean a *deviation* in the expected direction such that the *critical ratio* is 2.5 times the *standard deviation* (or four times the probable error) or greater.]

STANDARD DEVIATION: A unit of measurement in statistical method; that *deviation* above and below *mean chance expectation* which is expected to include about ⅔ the *chance scores.* For *ESP cards,* S. D. = $2\sqrt{\text{no. of runs}}$.

SUBJECT: The person who is experimented upon. Most commonly the *percipient* in *ESP,* though also the *agent* in *telepathy.*

TARGET CARD: The card which the *percipient* is attempting to perceive (i.e. to *call,* or otherwise indicate a knowledge of).

TARGET DECK: The *deck* of cards the order of which the *subject* is *calling.*

TELEPATHY: *Extra-sensory perception* of the mental activities of another person. It does not include the *clairvoyant* perception of objective events.

TOUCH MATCHING: The technique in which the *subject* indicates his *call* by tapping or touching one of the five *key cards* while the *experimenter* places the *target card* thus called in front of the *key card* indicated.

TRIAL: A single *call* of a presented *symbol.*

X VALUE = CRITICAL RATIO: The observed *deviation* divided by the *standard deviation* or by the *probable error.*

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